

IN THE CLAIMS

Please cancel claims 14 - 33, without prejudice.

Please substitute for corresponding pending claims the revised claims as shown rewritten below with amendments effected therein. Appendix I is attached to this document having marked versions of the revised claims. As illustrated by Appendix I, deletions to the revised claims are indicated by brackets (“[]”) and insertions are indicated by underlining (“ ”).

Revised Claims

1. (Revised) A graft coated substrate, the substrate comprising polyethylene, and a graft coating covalently bonded thereto, wherein said graft coating comprises a non-polyethylene polymer or copolymer and a flame retardant.

2. (Revised) The graft coated substrate of claim 1, wherein the graft coating comprises a non-polyethylene polymer or copolymer selected from the group consisting of a urethane, an epoxy, a polysilicone, and combinations or copolymers thereof.

3. (Revised) The graft coated substrate of claim 1 wherein the graft coating further comprises materials selected from the group consisting of a pigment or colorant, and combinations thereof.

34. (Revised) The graft coated substrate of claim 1, prepared by a process comprising:
applying a liquid composition to the substrate,

wherein the liquid composition comprises a monomer or prepolymer, a metal ion graft initiator, a peroxide catalyst, a polymerization promoter reactive with the monomer or prepolymer, and a flame retardant and

polymerizing the monomer or prepolymer to the substrate.

35. (Revised) An article of manufacture comprising the graft coated substrate of claim 34 .

Please add the following new claims

37. (New) The graft coated substrate of claim 34 wherein the process further comprises preparing the liquid composition by combining a Part A solution and a Part B solution prior to application to the substrate, wherein the Part A solution comprises:

(I) a monomer or prepolymer suitable for grafting to the substrate, in an amount ranging from 0.1 to about 50%, by weight of the liquid composition, selected from the group consisting of water-dispersed epoxy monomers, aliphatic moisture-curable urethanes, aromatic urethane prepolymers, silane prepolymers, vinyl and epoxy functional silanes and combinations thereof;

(ii) a metal ion graft initiator in an amount ranging from about 0.01 to about 1.0% by weight, relative to the weight of prepolymer or monomer in the liquid composition, selected from the group consisting of ions of silver, iron, silver, cobalt, copper and cerium;

(iii) a peroxide catalyst in an amount ranging from about 0.1 to about 5%, selected from the group consisting of hydrogen peroxide, an organic peroxide, and combinations thereof;

(iv) a flame retardant in an amount ranging from about 0.1 wt percent to about 10 wt percent of the solution, selected from the group consisting of chlorinated phosphate esters, melamine derivatives, oligomeric phosphate esters, bromoaryl ether/phosphate product, and phosphonates and;

a compatible solvent or solvents;

wherein the Part B solution comprises a polymerization promoter.

38. (New) The graft coated substrate of claim 37 wherein the polymerization promoter is selected from the group consisting of a polyfunctional aziridine liquid crosslinker and an aromatic polyisocyanate, in a concentration effective to react with, and crosslink, the monomer or prepolymer.

39. (New) The graft coated substrate of claim 38 wherein the monomer or prepolymer comprises an epoxy moiety, and the Part B solution further comprises at least one epoxy hardener or curing agent.

40. (New) The graft coated substrate of claim 34 wherein the monomer or prepolymer of the liquid composition is selected from the group consisting of a vinyl monomer, a urethane monomer, an epoxy monomer, a silicon-based monomer and combinations thereof and is present in a concentration ranging from about 0.1 to about 50%, by weight, relative to the liquid composition.

41. (New) The graft coated substrate of claim 34 wherein the graft initiator of the liquid composition is selected from the group consisting of ions of iron silver, cobalt, copper, cerium and combinations thereof in a concentration ranging from about 0.01 to about 1.0%, by weight, relative to the liquid composition..

42. (New) The graft coated substrate of claim 41 wherein the graft initiator of the liquid composition is a silver ion.

43. (New) The graft coated substrate of claim 34 wherein the peroxide catalyst of the liquid composition is present in a concentration ranging from about 0.1 to about 5% by weight relative to the weight of the liquid composition and is selected from the group consisting of hydrogen peroxide and an organic peroxide.

44. (New) The graft coated substrate of claim 34 wherein the peroxide catalyst of the liquid composition is selected from the group consisting of benzoyl peroxide, methyl ethyl ketone peroxide, 1-butyl hydroperoxide, urea peroxide, and combinations thereof.

45. (New) The graft coated substrate of claim 34 wherein the polymerization promoter of the liquid composition is selected from the group consisting of a polyfunctional aziridine liquid crosslinker and an aromatic polyisocyanate, in a concentration effective to crosslink the monomer or prepolymer.

46. (New) The graft coated substrate of claim 34 wherein the process comprises applying the liquid composition to the substrate by a method selected from the group consisting of brushing, dipping, spraying and combinations thereof

47. (New) The graft coated substrate of claim 34 wherein the applied liquid composition is self-curing.

48. (New) The graft coated substrate of claim 34 wherein the process comprises curing the applied liquid composition by heating the coated substrate at a temperature and for a duration sufficient to cure the applied coating.

49. (New) The graft coated substrate of claim 48 wherein the process comprises curing the applied liquid composition at a temperature ranging from about 60 to about 200 degrees F., for a time period ranging from about 30 minutes to about 6 days.

50. (New) The graft coated substrate of claim 34 wherein the flame retardant is phosphorous-based.

51. (New) The graft coated substrate of claim 1 wherein the flame retardant is selected from the group consisting of chlorinated phosphate esters, melamine derivatives, oligomeric phosphate esters, bromoaryl ether/phosphate product, and phosphonates.

52. (New) The graft coated substrate of claim 34 wherein the flame retardant is selected from the group consisting of dimethyl methylphosphonate, diethyl-N, N-bis (2-hydroxyethyl) aminomethyl phosphonate, oligomeric chloroalkyl phosphate/phosphonate, tri (1, 3-dichloroisopropyl) phosphate, oligomeric phosphonate, tributyl phosphate, isopropylated triphenyl phosphate ester, and combinations thereof.

53. (New) The graft coated substrate of claim 34 wherein the flame retardant is dimethyl methylphosphonate.

54. (New) The graft coated substrate of claim 3 wherein the pigment comprises aluminum particles.

55. (New) The graft coated substrate of claim 34 wherein the liquid composition has a pH in a range of from about pH 6 to pH 8.

56. (New) A graft coated substrate, the substrate comprising polyethylene, and a graft coating covalently bonded thereto, prepared by a process comprising the steps of:

(a) contacting the substrate with a liquid composition comprising,

(I) a monomer or prepolymer suitable for grafting to the substrate, in an amount ranging from 0.1 to about 50%, by weight of the liquid composition, selected from the group consisting of water-dispersed epoxy monomers, aliphatic moisture-curable urethanes, aromatic urethane prepolymers, silane prepolymers, vinyl and epoxy functional silanes and combinations thereof;

(ii) a metal ion graft initiator in an amount ranging from about 0.01 to about 1.0%, by weight, relative to the weight of prepolymer or monomer in the liquid composition, selected from the group consisting of ions of silver, iron, silver, cobalt, copper and cerium;

(iii) a peroxide catalyst in an amount ranging from about 0.1 to about 5% by weight of